## **CLAIMS**

What is claimed is:

- 1. A method of optimizing a filter response of an arrayed waveguide 5 grating, the method comprising the steps of:
  - a) measuring a respective phase error of a plurality of waveguide cores of an arrayed waveguide grating; and
  - b) adjusting a respective optical path length of the cores in accordance with the respective phase error of the cores by adjusting a respective refractive index of the cores, thereby optimizing a filter response of the arrayed waveguide grating.
  - 2. The method of claim 1 wherein the respective phase error is measured using a low coherent optical interferometer.
  - 3. The method of claim 2 wherein the respective phase error is measured to within nanometer resolution.
- 4. The method of claim 1 wherein the respective refractive index is 20 adjusted by using laser energy.
  - 5. The method of claim 4 wherein the laser energy is ultraviolet laser energy.
- 25 6. The method of claim 1 wherein the adjusting of the refractive index of the cores is used to equalize channel power of the arrayed waveguide grating.

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8. The method of claim 1 wherein the refractive index of the cores is adjusted within a grating area of the arrayed waveguide grating by using laser energy.

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- 9. A method for performing wavefront reshaping on an arrayed waveguide grating, the method comprising the steps of:
- a) performing phase error measurement of a plurality of waveguide cores of an arrayed waveguide grating; and
- b) adjusting a respective optical path length of the cores in accordance with the phase error measurement by adjusting a respective refractive index of the cores, thereby performing wavefront reshaping on the arrayed waveguide grating.
- 10. The method of claim 9 wherein the phase error measurement is performed using a low coherent optical interferometer.
- 11. The method of claim 9 wherein the phase error measurement has a resolution of one nanometer or less.
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- 12. The method of claim 9 wherein the respective refractive index is adjusted by using laser energy within a grating area of the arrayed waveguide grating.

- 13. The method of claim 12 wherein the laser energy is ultraviolet laser energy.
- 5 14. The method of claim 13 wherein the adjusting of the refractive index of the cores is used to equalize channel power of the arrayed waveguide grating.
  - 15. The method of claim 9 wherein the adjusting of the refractive index of the cores is used to compensate for dispersion within the arrayed waveguide grating.
  - 16. An arrayed waveguide grating having a laser trimmed optimized filter response, comprising a plurality of waveguide cores within a grating, each of the plurality of cores having an optical path length adjustment region configured to receive laser energy and to adjust a respective refractive index within the adjustment region in response to the laser energy, the respective refractive index adjusted in accordance with a respective phase error of the cores to produce the optimized filter response.
- 20 17. The arrayed waveguide grating of claim 16 wherein each of the optical path length adjustment regions are configured to receive ultraviolet laser energy.